

*AMENDMENTS TO THE CLAIMS*

This listing of claims will replace all prior versions, and listings, of claims in the application.

*Listing of Claims*

Claim 1 (Currently amended): An isolated peptide selected from the group consisting of:

Conotoxin-Af6: X<sub>6</sub>GQDDSX<sub>1</sub>X<sub>1</sub>DSQX<sub>2</sub>VMX<sub>2</sub>HGQRRERR<sup>^</sup> (SEQ ID NO:1);

Conotoxin-Bt1: GGX<sub>1</sub>X<sub>1</sub>VRX<sub>1</sub>SAX<sub>1</sub>TLHX<sub>1</sub>LTX<sub>5</sub><sup>^</sup> (SEQ ID NO:2);

Conotoxin-Bt2: GGX<sub>1</sub>X<sub>1</sub>VRX<sub>1</sub>SAX<sub>1</sub>TLHX<sub>1</sub>ITX<sub>5</sub><sup>^</sup> (SEQ ID NO:3);

Conotoxin-Bt3: DGX<sub>1</sub>X<sub>1</sub>VRX<sub>1</sub>AAX<sub>1</sub>TLNX<sub>1</sub>LTX<sub>5</sub><sup>^</sup> (SEQ ID NO:4);

Conotoxin-Bt4: GYX<sub>1</sub>DDR<sub>1</sub>IA<sub>1</sub>TVRX<sub>1</sub>LX<sub>1</sub>X<sub>1</sub>A# (SEQ ID NO:5);

Conotoxin-Bt5: GGGX<sub>1</sub>VRX<sub>1</sub>SAX<sub>1</sub>TLHX<sub>1</sub>ITX<sub>5</sub><sup>^</sup> (SEQ ID NO:6);

Conotoxin-Bu1: NX<sub>5</sub>X<sub>1</sub>TX<sub>3</sub>IX<sub>1</sub>IVX<sub>1</sub>ISRX<sub>1</sub>LX<sub>1</sub>X<sub>1</sub>I# (SEQ ID NO:7);

Conotoxin-Bu2: NX<sub>5</sub>X<sub>1</sub>TX<sub>3</sub>X<sub>3</sub>NLX<sub>1</sub>LVX<sub>1</sub>ISRX<sub>1</sub>LX<sub>1</sub>X<sub>1</sub>I# (SEQ ID NO:8);

Conotoxin-C1: SDX<sub>1</sub>X<sub>1</sub>LLRX<sub>1</sub>DVX<sub>1</sub>TVLX<sub>1</sub>LX<sub>1</sub>RN# (SEQ ID NO:9);

Conotoxin-C2: GDX<sub>1</sub>X<sub>1</sub>LLRX<sub>1</sub>DVX<sub>1</sub>TVLX<sub>1</sub>LX<sub>1</sub>RD# (SEQ ID NO:10);

Conotoxin-C3: SDX<sub>1</sub>X<sub>1</sub>LLRX<sub>1</sub>DVX<sub>1</sub>TVLX<sub>1</sub>PX<sub>1</sub>RN# (SEQ ID NO:11);

Conotoxin-C4: IX<sub>1</sub>X<sub>1</sub>GLIX<sub>1</sub>DLX<sub>1</sub>TARX<sub>1</sub>RDS# (SEQ ID NO:12);

Conotoxin-C5: IX<sub>1</sub>X<sub>1</sub>GLIX<sub>1</sub>DLX<sub>1</sub>AARX<sub>1</sub>RDS# (SEQ ID NO:13);

Conotoxin-C6: GX<sub>1</sub>X<sub>5</sub>X<sub>1</sub>VGSIX<sub>5</sub>X<sub>1</sub>AVRQQX<sub>1</sub>CIRNNNNRX<sub>5</sub>X<sub>4</sub>CX<sub>5</sub>X<sub>2</sub><sup>^</sup>  
(SEQ ID NO:14);

Conotoxin-Di1: TITAX<sub>1</sub>X<sub>1</sub>AX<sub>1</sub>RTSX<sub>1</sub>RMSSM# (SEQ ID NO:15);

Conotoxin-Di2: X<sub>6</sub>X<sub>1</sub>TX<sub>5</sub>TX<sub>5</sub>X<sub>1</sub>X<sub>1</sub>VX<sub>1</sub>RHTX<sub>1</sub>RLKSM# (SEQ ID NO:16);

Conotoxin-Ep1: GGKDIVX<sub>1</sub>TITX<sub>1</sub>LX<sub>1</sub>X<sub>2</sub>I# (SEQ ID NO:17);

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Conotoxin-Fi1:  $GX_1X_1X_1VAX_1MAAX_1IARX_1NQAN\#$  (SEQ ID NO:18);  
Conotoxin-Fi2:  $SX_3X_1QARX_1VQX_1AVNX_1LX_2X_1R\#$  (SEQ ID NO:19);  
Conotoxin-Fi2a:  $SX_3X_1QARX_1VQX_1AVNX_1LX_2X_1RGX_2X_2IIMLG\#$  (SEQ ID NO:20);  
DTRQF<sup>^</sup> (SEQ ID NO:20);  
Conotoxin-Fi3:  $D\ X_3X_1DDRX_1IAX_1TVRX_1LX_1X_1I\#$  (SEQ ID NO:21);  
Conotoxin-Fi4:  $GNTAX_1X_1VRX_1AAX_1TLHX_1LSL\#$  (SEQ ID NO:22);  
Conotoxin-Fi5:  $GSISM\#$  (SEQ ID NO:23);  
Conotoxin-L1:  $GX_1X_1X_1VAX_1MAAX_1IARX_1NAAN\#$  (SEQ ID NO:24);  
Conotoxin-L2:  $GX_2X_1X_1DRX_1IVX_1TVRX_1LX_1X_1I\#$  (SEQ ID NO:25);  
Conotoxin-L3:  $GX_1X_1X_1VAX_2MAAX_1LTX_1X_1AVX_2\#$  (SEQ ID NO:26);  
Conotoxin-P1:  $GX_1X_1X_1HSX_2X_3QX_1CLR\#$  (SEQ ID NO:27);  
Conotoxin-P2:  $GX_1X_1X_1HSX_2X_3QX_1CLR\#$  (SEQ ID NO:28);  
Conotoxin-P3:  $GX_1X_1X_1HSX_2X_3QX_1CLR\#$  (SEQ ID NO:29);  
Conotoxin-P4:  $GX_1AX_1HX_3AFQX_1CLR\#$  (SEQ ID NO:30);  
Conotoxin-P5:  $GLX_1X_1DIX_1FIX_1TIX_1X_1I\#$  (SEQ ID NO:31);  
Conotoxin-Sm1:  $ITX_1TDIX_1LVMX_2LX_1X_1I\#$  (SEQ ID NO:32);

wherein  $X_1$  is Glu or  $\gamma$ -carboxyglutamic acid (Gla);  $X_2$  is Lys, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys or N,N,N-trimethyl-Lys;  $X_3$  is Tyr, mono-halo-Tyr, di-halo-Tyr, O-sulpho-Tyr, O-phospho-Tyr or nitro-Tyr;  $X_4$  is Trp (D or L) or halo-Trp (D or L);  $X_5$  is Pro or hydroxy-Pro; and  $X_6$  is Gln or pyroglutamate.

Claim 2 (original): A derivative of the peptide of claim 1, in which the Arg residues may be substituted by Lys, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Lys residues may be substituted by Arg, ornithine, homoargine, nor-Lys, or any synthetic basic amino acid; the Tyr residues may be substituted with meta-Tyr, ortho-Tyr, nor-Tyr, mono-halo-Tyr, di-halo-Tyr, O-sulpho-Tyr, O-phospho-Tyr, nitro-Tyr or any synthetic hydroxy containing amino acid; the Ser residues may be substituted with Thr or any synthetic hydroxylated amino acid; the Thr residues may be substituted with Ser or any synthetic hydroxylated amino acid; the Phe residues may be substituted with any synthetic aromatic amino acid; the Trp residues may be substituted with Trp (D), neo-Trp, halo-Trp (D or L) or any aromatic synthetic amino acid; the Asn, Ser, Thr or Hyp residues may be glycosylated; the Tyr residues may also be substituted with the 3-hydroxyl or 2-hydroxyl isomers (meta-Tyr or ortho-Tyr, respectively) and corresponding O-sulpho- and O-phospho-derivatives; the acidic amino acid residues may be substituted with any synthetic acidic amino acid; and the aliphatic amino acids may be substituted by synthetic derivatives bearing non-natural aliphatic branched or linear side chains  $C_nH_{2n+2}$  up to and including  $n=8$ .

Claims 3-4 (canceled).

Claim 5 (Currently amended): An isolated conopeptide propeptide having an amino acid sequence ~~set forth in Table 4~~ selected from the group consisting of the amino acid sequences set forth in SEQ ID NO:37, SEQ ID NO:40, SEQ ID NO:43, SEQ ID NO:46, SEQ ID NO:49, SEQ ID NO:52, SEQ ID NO:55, SEQ ID NO:58, SEQ ID NO:61, SEQ ID NO:64, SEQ ID NO:67, SEQ ID NO:70, SEQ ID NO:73, SEQ ID NO:76, SEQ ID NO:79, SEQ ID NO:82, SEQ ID NO:85, SEQ ID NO:88, SEQ ID NO:91, SEQ ID NO:94, SEQ ID NO:97, SEQ ID NO:100, SEQ ID NO:103, SEQ ID NO:106, SEQ ID NO:109, SEQ ID NO:112, SEQ ID NO:115, SEQ ID NO:118, SEQ ID NO:121, SEQ ID NO:124, SEQ ID NO:127, and SEQ ID NO:130.

Claims 6-24 (canceled).

Claim 25 (new): The isolated peptide of claim 1, wherein the peptide is conotoxin-Bt5.

Claim 26 (new): A derivative of the peptide of claim 25, in which the Arg residues may be substituted by Lys, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Lys residues may be substituted by Arg, ornithine, homoargine, nor-Lys, or any synthetic basic amino acid; the Ser residues may be substituted with Thr or any synthetic hydroxylated amino acid; the Thr residues may be substituted with Ser or any synthetic hydroxylated amino acid; the acidic amino acid residues may be substituted with any synthetic acidic amino acid; and the aliphatic amino acids may be substituted by synthetic derivatives bearing non-natural aliphatic branched or linear side chains  $C_nH_{2n+2}$  up to and including  $n=8$ .

Claim 27 (new): The isolated peptide of claim 25, wherein the peptide has the sequence GGGX<sub>1</sub>VRX<sub>1</sub>SAX<sub>1</sub>TLHX<sub>1</sub>ITP<sup>^</sup> (SEQ ID NO:138).

Claim 28 (new): A derivative of the peptide of claim 27, in which the Arg residues may be substituted by Lys, ornithine, homoargine, nor-Lys, N-methyl-Lys, N,N-dimethyl-Lys, N,N,N-trimethyl-Lys or any synthetic basic amino acid; the Lys residues may be substituted by Arg, ornithine, homoargine, nor-Lys, or any synthetic basic amino acid; the Ser residues may be substituted with Thr or any synthetic hydroxylated amino acid; the Thr residues may be substituted with Ser or any synthetic hydroxylated amino acid; the acidic amino acid residues may be substituted with any synthetic acidic amino acid; and the aliphatic amino acids may be substituted by synthetic derivatives bearing non-natural aliphatic branched or linear side chains  $C_nH_{2n+2}$  up to and including  $n=8$ .

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Claim 29 (new): The isolated conopeptide propeptide of claim 5, wherein the peptide has the amino acid sequence set forth in SEQ ID NO:73.